## NOTES.

THE formal transfer of Stonehenge by Mr. C. H. E. Chubb, of Salisbury, to the nation, represented by the First Commissioner of Works, on Saturday last, was a simple but effective ceremony. One of the horizontal stones in the centre made a good platform, with the great monolith replaced by Prof. Gowland as a background. Mr. Chubb made a modest and interesting speech as to the motives which had inspired him to make this generous and patriotic gift to the nation, believing that so ancient a monument should never have been in private hands. He presented the deed of gift to Sir Alfred Mond, who, in accepting it, said he was authorised by the Prime Minister to express his personal appreciation of Mr. Chubb's public spirit. He gave great satisfaction by stating that it was his intention to make a sunken fence in lieu of the wire fence now existing, which interferes to some extent with the view of the monument. Sir Alfred Mond was accompanied by Sir Lionel Earle and by Mr. Peers, the Chief Inspector of Ancient Monuments. Sir H. C. Sclater, the General Commanding in Chief the Southern Command, said that the military authorities would co-operate with the Office of Works in protecting the monument. Other addresses were delivered by Sir C. Hercules Read, Sir Arthur Evans, and Mr. Heward Bell (representing the Wiltshire Archæological Society). Mr. Chubb's gift comprises not only Stonehenge itself, but also thirty acres of land surrounding it, the possession of which will be useful to the Office of Works in the measures it proposes to take for preserving and protecting the monument.

ADMIRAL SIR ALBERT HASTINGS MARKHAM, K.C.B., whose death occurred on Monday last, did much for the furtherance of knowledge in the Arctic regions. Entering the Navy in 1856, when he was fifteen years of age, he saw considerable service in the East before the fascination of polar exploration appealed to him, mainly through a paper which the late Admiral Sir Sherard Osborn read before the Royal Geographical Society in 1865. He was afterwards entrusted by the Admiral with the command of the whaler *Arctic*, in which he carried out a cruise to Baffin's Bay and the Gulf of Boothia. In 1875 he was appointed second-in-command of the Government Arctic expedition under Sir George Nares. In spite of many difficulties, he successfully navigated his ship, the *Alert*, into winter quarters on the north-east coast of Grant Land in latitude 82° 27′ N., which was the highest point then attained by ship or man. In the spring of the following year he set out over the ice of the Polar Sea in charge of the northern party and reached latitude 83° 20′ N. This was only seventy-three miles from the ship in a straight line, but the party covered no fewer than 276 miles on the outward and 245 miles on the homeward journey. In appreciation of his discoveries Admiral Markham was presented with a gold watch by the Royal Geographical Society; in later years he was a prominent member of the society's council. In 1879 he carried out an expedition to Novaya Zemlya in company with Sir Henry Gore Booth, and in 1886 studied the conditions of navigation in Hudson's Strait on board his old ship, the *Alert*, in connection with the Canadian Government's proposals for the establishment of a summer service between Fort Churchill and England. In the course of his career Admiral Markham contributed largely to the literature of polar exploration, and he wrote the biography (published last year) of his cousin, the late Sir Clements Markham.

WE regret to learn of the premature death of Dr. Charles Rochester Eastman, of the American Museum of Natural History, in his fifty-first year. Dr. Eastman was born at New Orleans, and completed his education at the University of Munich, where he studied palæontology under Prof. K. A. von Zittel, and graduated as Ph.D. in 1894. His thesis was an important memoir on a fossil shark, *Oxyrhina mantelli* from the chalk of Kansas, and most of his subsequent researches were on fossil fishes. From 1895 until 1909 he was assistant for vertebrate palæontology in the Museum of Comparative Zoology, Harvard University, where he arranged and described the great collection of fossil fishes. From 1910 to 1912 he held a temporary appointment in the Carnegie Museum, Pittsburgh, where he published illustrated descriptive catalogues of the Eocene fishes from Monte Bolca and the Jurassic fishes from the lithographic stone of Germany and France. He also lectured on vertebrate palæontology in the University of Pittsburgh. In 1915 he became one of the newly instituted research associates of the American Museum of Natural History, New York. In 1900–2 Dr. Eastman did good service to biological science by editing two volumes of a revised English translation of Prof. von Zittel's "Grundzüge der Palæontologie," and during recent years he wrote several interesting papers on natural history in medieval books. He also co-operated with Dr. Bashford Dean in preparing the valuable and exhaustive bibliography of fishes, of which two volumes have lately been published by the American Museum.

MR. ARTHUR CANNON, whose death occurred on October 13, has left behind a valuable record of work accomplished. Following upon a distinguished career at Greenwich College, to which he passed from Devonport Dockyard, Mr. Cannon became assistant to Sir John Biles at Glasgow University. While occupying that position he was, in 1912, appointed to the research scholarship in naval architecture awarded by the Royal Commissioners for the Exhibition of 1851. The programme of research outlined by him included the experimental investigation of the rolling of ships amongst waves, and to that subject and others akin to it the two years of the scholarship were devoted. Beginning with a purely mathematical treatment of the effect of "loose" water upon stability, Mr. Cannon pointed out for the first time the valuable conclusion that the initial stability is at a maximum when the "loose" water admitted to the interior of a ship is at the same level as the water outside, but that this condition is the worst for stability at large angles of inclination. He then proceeded to investigate experimentally the effect of "loose" water upon rolling. This part of the research was carried out on the rolling machine at Glasgow University (a variation of Russo's navipendulum), and led to the conclusion that, whereas in ordinary circumstances the "free" oscillation is the dominant factor in rolling, in the case in which there is a considerable amount of "loose" water in the ship the "forced" oscillation is the dominant factor. The results of this research are of especial value in connection with the fitting of "anti-rolling" tanks, in that they indicate the beneficial effects of small quantities of loose water and the harmful effects of large quantities. A further research into the subject of the rolling of ships had reference to the period of roll at large angles of inclination. The full record of Mr. Cannon's research is contained in the Transactions of the Institution of Naval Architects, and its value was marked by the award of the annual premium to him by the council of the institution on two occasions. Through his untimely death at only thirty-two years of age the profession of naval architecture loses a valued member.

In 1914 Mr. Cannon was appointed Assistant Naval Constructor at the Admiralty, and at the time of his death he was the Admiralty overseer on submarine-building at Messrs. Cammell Laird and Co.'s yard, Birkenhead.

WE regret to announce the death on October 9, at twenty-nine years of age, of Mr. Robert John Pocock, director of the Nizamiah Observatory, Hyderabad.

DR. G. E. MOORE will deliver his inaugural presidential address to the Aristotelian Society at 22 Albemarle Street on Monday, November 4, at 8 p.m., upon the subject of "Some Judgments of Perception."

THE John Scott legacy medal and premium has, on the recommendation of the Franklin Institute, been awarded to Mr. F. P. Fahy in consideration of the development of the Fahy permeameter.

WE much regret to announce the death on October 26, at eighty-seven years of age, of the Rev. A. M. Norman, F.R.S., honorary canon of Durham, and an eminent worker in many fields of natural history.

WE notice with regret the announcement of the death on October 23, in his ninety-first year, of Mr. R. Brudenell Carter, the distinguished ophthalmic surgeon and author of several valuable works upon ophthalmic subjects.

DR. A. SMITH WOODWARD, keeper of the Geological Department of the British Museum (Natural History), has been awarded the Cuvier prize by the French Academy of Sciences. Other British recipients of the prize have been Sir Richard Owen, Sir Roderick Murchison, and Sir John Murray.

DR. A. L. DAY, who has been director of the geophysical laboratory of the Carnegie Institution of Washington since its establishment in 1906, has resigned the position to engage in research work on glass and allied materials for the Corning Glass Works, Corning, New York.

THE hundredth session of the Institution of Civil Engineers will be opened on Tuesday, November 5, at 5.30 p.m., when Sir John A. F. Aspinall, president, will deliver an address, and will present awards made by the council for papers read and discussed or otherwise dealt with during the past session.

PROF. A. N. SKINNER, formerly professor of mathematics at the U.S. Naval Academy and assistant astronomer of the Naval Observatory, died on August 14, aged seventy-three years. Prof. Skinner discovered four variable stars, and was responsible for 20,000 observations to determine the positions of 8824 stars for the *Astron. Gesell.* catalogue.

THE death of Mr. Henry Westlake, at the age of seventy-two years, is recorded in the *Engineer* for October 25. Mr. Westlake was a prominent figure in South Yorkshire, and was for some years a director of Cammell Laird and Co., Ltd., and of the Workington Iron and Steel Co. For more than fifty years he was associated with the Staveley Coal and Iron Co.

WE regret to note that the *Engineer* for October 25 records the death of Mr. J. F. L. Crosland, who was connected with the Vulcan Boiler and General Insurance Co. for forty-nine years, during the last twenty-four of which he was chief engineer of the company. Mr. Crosland was a member of the Institutions of Civil, Mechanical, and Electrical Engineers, and took a prominent part in legislation dealing with boiler accidents. He was seventy-nine years of age at the time of his death.

THE death of Mr. Thomas Charles Hutchinson, the managing director of the Skinningrove Iron Co., is announced in the *Engineer* for October 25. Mr. Hutchinson was born in 1840, and played a great part in the development of the Cleveland district. He formulated a scheme for the erection of steel works in connection with the existing blast-furnace plant of his firm, adopted the new Talbot process, and installed the first electrically driven cogging mill in Great Britain. He took a keen interest in the Iron and Steel Institute and other kindred societies.

MR. THOMAS CODRINGTON, who died on October 21, aged eighty-nine, was a civil engineer deeply interested in geology. For nearly sixty years he had been a fellow of the Geological Society, and he contributed several papers on the geology of Hampshire, the Isle of Wight, South Wales, and other districts. He discovered the only known petrified rootlets, probably of palms, in the tubular hollows of the Berkshire sarsen stones, and he was the first to recognise the gizzard stones in a fossil reptile, a Plesiosaurian which he found in the greensand of Wiltshire.

*Engineering* for October 25 records the death of Mr. Josiah Richard Perrett, who for many years was an active agent in the development of warship design in this country, particularly at Elswick. Mr. Perrett did valuable work in the earlier days of experimental research into the resistance of ships at Dr. Froude's tank. He was born in 1848, and received his training at H.M. Dockyard, Devonport, the Royal School of Naval Architecture, the Chatham Dockyard, and the Admiralty. He joined the Elswick shipyard in 1887 as first assistant to Sir Philip Watts. He received decorations from Japan, Italy, and Turkey; a paper by him was read at the last Newcastle meeting of the Institution of Naval Architects.

M. PAUL KESTNER, the president of the Société de Chimie Industrielle, a society which has been recently formed to promote the organisation and development of industrial chemistry in France, will deliver an address on "The Alsace Potash Deposits and their Economic Significance in relation to Terms of Peace" to the London Section of the Society of Chemical Industry on Monday next, November 4; the meeting will be held at the rooms of the Society of Arts, John Street, Adelphi, at 7.30 p.m. M. Kestner is being entertained to luncheon on that day by the Society of Chemical Industry, and the company will include Lord Moulton, Lord Burnham, Sir Robert Hadfield, Sir Alfred Keogh, Sir Alfred Mond, Sir Arthur Churchman, Sir Charles Parsons, Sir Boverton Redwood, Profs. Louis, Pope, and Armstrong, Dr. Keane, and other distinguished chemists and engineers, the Sheriffs of the City of London, and several chemical manufacturers representing this important industry. The guests are invited by the Lord Mayor to tea at the Mansion House in the afternoon.

AT a meeting of the council of the Institute of Chemistry, held on October 25, it was reported by the General Purposes Committee that the position of the institute in connection with the proposals contained in the Whitley report had been under consideration. A letter had been addressed to the Minister of Labour pointing out that, although modern productive industry depended so much on the work of chemists, engineers, and the like, such technical experts do not appear to have any place in the constitution of the industrial councils; but, in view of the fact that it was proposed that the industrial councils should deal with such subjects as technical education and training, industrial research, utilisation of inventions and improvements, and industrial experiments, the Minister of Labour had been asked (*a*) whether it was intended that qualified professional technical experts should be represented on the industrial councils, and (*b*) whether it was desired that the professional bodies representing such men should be brought into consultation in any way in connection with the technical matters referred to. On the recommendation of the Public Appointments Committee, the council has approved a statement on the necessity for a definitely organised Government chemical service, which will shortly be brought to the notice of all Government Departments concerned.

The second and third Chadwick lectures on "The Story of a New Disease" were delivered by Dr. Crookshank on October 17 and 24. In the second lecture epidemic encephalo-myelitis (the Heine-Medin disease or infantile paralysis) was considered. First described by Willis in 1661, the disease has recurred again and again, frequently assuming different types, the latest in this country occurring during the present year and resembling in many respects "botulism," a form of food-poisoning. Two forms of so-called food-poisoning, raphania and botulism, were discussed in the third lecture. Raphania was the name given in the eighteenth century by Linnæus and his pupils to an epidemic disorder characterised by mental affections, paralyses, and convulsions, that spread throughout Sweden, and was ascribed by Linnæus to admixture of radish-seeds with foodstuffs. It has been confused by later German writers with ergotism. Botulism is a disease of the nineteenth century, usually traced to the consumption of sausage and allied comestibles. The lecturer suggested that both botulism and raphania are caused by the virus of the Heine-Medin disease, and directed attention to modifications in the soil (*i.e.* the individual) in causing varying manifestations of the viruses of epidemic diseases.

At the statutory meeting of the Royal Society of Edinburgh, held on October 28, the following office-bearers were elected:—*President:* Dr. J. Horne. *Vice-Presidents:* Prof. D'Arcy Thompson, Prof. J. Walker, Prof. G. A. Gibson, Dr. R. Kidston, Prof. D. Noël Paton, and Prof. A. Robinson. *General Secretary:* Dr. C. G. Knott. *Secretaries to Ordinary Meetings:* Prof. E. T. Whittaker and Dr. J. H. Ashworth. *Treasurer:* Mr. J. Currie. *Curator of Library and Museum:* Dr. A. Crichton Mitchell. *Councillors:* Sir G. A. Berry, Dr. J. S. Flett, Prof. Magnus Maclean, Prof. D. Waterston, Prof. F. O. Bower, Prof. P. T. Herring, Prof. T. J. Jehu, Dr. A. Lauder, the Hon. Lord Guthrie, Sir E. Sharpey Schäfer, Prof. J. Lorrain Smith, and Dr. W. A. Tait. Dr. W. A. Tait was also elected the society's representative on George Heriot's Trust.

A letter from Mr. Stefansson, written on July 20, from Fort Yukon, Alaska, is published in the *Geographical Journal* for October (vol. lii., No. 4), and gives some further details of the work of the Canadian Arctic Expedition during the last four years, additional to the discoveries of the southern party, which have already been announced. The north-west coastline of Prince Patrick Island and the north-east coastline of Victoria Island were completed. The coastlines of Emerald and Fitzwilliam Owen Islands and the shores of Hassel Sound between the two Ringnes Islands were mapped. Several new islands were added to the Arctic Archipelago, including one in the Gustav Adolf Sea between lat. 77° 9′ N. and lat. 77° 55′ N. in about long. 107° to 108° 10′ W., and another in Prince Gustav Sea. Christian Island and Findlay Land appear to be distinct, and Isachsen Land is probably separated from Ellef Ringnes Island. Relatively deep water was found outside Gustav Adolf and Prince Gustav Seas, making the existence of other islands to north-west improbable. Reindeer were found on all the islands visited, but musk-oxen only on Melville and Victoria Islands. On Banks Island they have been exterminated by the Eskimo attracted there by the wreck of Sir Robert McClure's *Investigator*, which they visited for iron year after year. Seals were plentiful on nearly all shores, but polar bears were very local. Mr. Stefansson had hoped to start in January this year on a sledge-journey northwards from Alaska. He had intended to travel about two hundred miles and then form an encampment on a floe and drift throughout the summer, taking soundings as he went. In this way he hoped to accomplish some of the work of the ill-fated *Karluk*. An attack of typhoid fever, however, forced his return to civilisation as soon as possible. We are glad to hear that he has now recovered and proposes to start a lecture-tour on behalf of the Red Cross.

Capt. F. R. Barton contributes to the Journal of the Royal Anthropological Institute (vol. xlviii., part i., 1918) an elaborate account of tattooing in south-eastern New Guinea, illustrated by excellent photographs and drawings, a vocabulary of the terms used in the art, and some folk-tales. One of the stories indicates the idea that tattooing was evolved from skin-painting and provides an interesting parallel to similar theories current among the Maoris of New Zealand.

In the issue of *Man* for October Mr. H. Balfour describes a collection made by Mr. Clough in the Chatham Islands, now deposited in the Pitt Rivers Museum, Oxford. The most remarkable specimens are a fine bone dagger and a grotesque statuette carved in pumice-stone. Mr. Balfour is not aware of any close parallel to these articles. As he has recently pointed out, the evidence of a strong Melanesian element in the culture of Easter Island is very striking, and inasmuch as the presence of a similar non-Polynesian strain in the culture of the Chatham Islands—and, one may add, in New Zealand—is becoming more generally recognised, the suggestion offered as to the possible affinities of these articles may have considerable bearing on the ethnological problems of the South Pacific.

A very useful summary of the captures of the North Atlantic black Right whale, or Nordcaper (*Balaena biscayensis*), in Scottish waters, from 1905 to 1914, is given by Prof. D'Arcy Thompson in the *Scottish Naturalist* for September. The grand total for this period amounted to sixty-seven, but, it is to be noted, two-thirds of this total were taken during 1908 and 1909. The marked inequality in the numbers annually taken seems to be accounted for by the movements of the Gulf Stream, since when its waters are abundant the whales are scarce. Prof. Thompson suggests that when the Gulf Stream is warm and strong the whales keep further out to sea, but that when there is only little stream they are tempted to linger on our coast. He is of opinion that this whale is far from becoming extinct, but the evidence does not seem to bear out this optimistic view. He also makes some interesting comments on its size, which is commonly regarded as smaller than that of the Greenland whale. The evidence, so far as it goes, he suggests, seems to show that there is little difference, if any, between them in this respect. Figures are also given showing the numbers of rorquals—three species

—sperm, humpback, and bottle-nosed whales—taken at these stations during this period. The numbers are probably higher than most people would have supposed.

A new *Journal of General Physiology* is being published under the auspices of the Rockefeller Institute for Medical Research. The editors are Profs. Jacques Loeb and W. J. V. Osterhout. In the first instalment, which has just reached us, there are a number of interesting papers on photosynthesis, colloids, internal secretions, and regeneration in plants. Some doubt may be expressed, however, as to the need for another addition to the large number of journals devoted to experimental physiology and biochemistry.

Three important papers dealing with methods of testing the hardness of materials were presented for discussion at the Institution of Mechanical Engineers on October 18. The first paper, by Prof. C. A. Edwards and Mr. F. W. Willis, describes an impact method. The instrument employed consisted of a block of steel weighing 21 lb., which could be released by a mechanical device and allowed to drop 3 in. to the surface of the specimen under test. The energy of the blow was imparted to the surface of the specimen through a hardened steel ball 10 mm. in diameter firmly fixed to the weight. The impact energy was the same in all cases, namely, 63 in.-lb. The specimen was held very rigidly in a heavy steel base, and the whole arrangement was carefully bedded on a massive steel table. In another machine both weight and height of fall could be varied, so as to give energies of impact between 1·75 and 147 in.-lb. The results obtained may be expressed by the equation $d = CE^{0\cdot25}$, where $d$ is the diameter of the indent made by a 10-mm. ball, C is a coefficient which varies with the hardness of the metal, and E is the total energy of impact. The second paper, by Mr. R. G. C. Batson, of the National Physical Laboratory, dealt with both static and impact methods. Within the limits of Mr. Batson's impact experiments it is shown that the energy of the blow is proportional to the volume of indentation for cone and ball indenting tools, and the dynamic hardness number suggested is equal to energy of blow in kg./volume of indentation in $\text{cm.}^3$ Further, the energy of the blow is proportional to the square of the spherical area of the indentation for ball indenting tool only, and the volume of indentation (and therefore the dynamic hardness number) is approximately independent of the form of the indenting tool (cone, 10-mm. ball, and 4·76-mm. ball). The third paper, by Prof. W. C. Unwin, deals with the Ludwik hardness test, in which geometrically similar indentations are made by use of a right-angled cone. Prof. Unwin suggests that a cone slightly truncated might be employed with advantage; such a cone is more durable than one with a sharp point, and the results differ slightly only. The discussion of these papers brought out a great deal of valuable information, and will be continued at the meeting on November 15.

Among forthcoming books of science we notice the following:—"Hot-bulb Oil Engines and Suitable Vessels," W. Pollock, and "The Production and Treatment of Vegetable Oils," T. W. Chalmers (*Constable and Co., Ltd.*); "Tri-lingual Artillery Dictionary," E. S. Hodgson, vol. ii., French-Italian-English, and vol. iii., Italian-French-English (*Charles Griffin and Co., Ltd.*); and a new and revised edition of the late D. K. Clark's "Mechanical Engineer's Pocket-book," H. H. P. Powles (*Crosby Lockwood and Son*).

## OUR ASTRONOMICAL COLUMN.

The Planet Jupiter.—This brilliant object now rises at about 8 p.m., and is visible during the whole of the night which follows. Its position is between the stars $\delta$ and $\zeta$ in Gemini, and, the north declination being 22½°, the planet remains above the horizon during 16¾ hours. During the coming winter it will be very favourably situated for telescopic observation. Mr. Denning states that the great red spot continues faintly visible south of the hollow or bay in the south equatorial belt, and the former objects have exhibited an increasing velocity since 1900, when the rotation period was 9h. 55m. 41·5s. In the present year between May and August the period had declined to 9h. 55m. 31·4s., as determined by Mr. F. Sargent, of Bristol, from observations by the Rev. T. E. R. Phillips and himself. On May 12 the longitude of the red spot was 45°, and on August 9 25°.

If the same rate of motion has been maintained during the interval since August 9, then the present place of the spot is in longitude 6°, and it follows the zero meridian (system II.) given in the *Nautical Almanac* (1918, p. 541) by about ten minutes.

Early in December next the position of the red spot may be expected to correspond nearly with the zero meridian of system II., and will therefore transit at the same time. It will be interesting to observe the times of mid-transit of the red spot, which may be expected nearly as follows:—

| | | h. | m. | | | | h. | m. | |
|---|---|---|---|---|---|---|---|---|---|
| November | 7 | 9 | 51 | p.m. | December | 1 | 9 | 28 | p.m. |
| | 9 | 11 | 28 | ,, | | 4 | 6 | 55 | ,, |
| | 14 | 10 | 33 | ,, | | 6 | 8 | 33 | ,, |
| | 19 | 9 | 40 | .. | | | | | |
| | 24 | 8 | 45 | ,, | | | | | |

The hollow in the belt seems to have been certainly visible on Jupiter since Schwabe figured it on September 5, 1831, while the red spot appears to have been first seen and drawn by Dawes on November 27, 1857.

The "great south tropical disturbance," which is a very extensive dusky spot in the same latitude as the red spot, has been visible since February, 1901. It is now distended over about 185 degrees of longitude from 265° to 90°. Moving at a swifter rate than the red spot, it has had the effect of considerably accelerating the speed of the latter in late years.

The Rate of Stellar Evolution.—On the supposition that Cepheid variation is due to some kind of pulsation having the period of light variation, Prof. A. S. Eddington has pointed out that the variations of period indicated by theory may provide a means of estimating the rate of progress of stellar evolution (*The Observatory*, vol. xli., p. 379). The periods of similar globes of fluid pulsating under their own gravitation would be inversely proportional to the square roots of the densities, and the changes of density in a particular star might therefore be deduced from the change of period. Adopting Chandler's estimate that the period of $\delta$ Cephei (5·366 days) is decreasing 0·05 sec. annually, the star would double its density in rather more than three million years, and would take about ten million years to pass from type G to type F. This rate of change is much slower than that derived from the assumption that contraction is the source of the star's heat. The time-scale would, in fact, be enlarged a thousandfold, and would become more consistent with present views as to the age of terrestrial rocks, the development of the earth-moon system, and geological change. Observations of the change of period in Cepheid variables would therefore seem to be of possibly great importance, and it is fortunate that they can usually be determined with great accuracy.